Name: Date:

Polynomial Factoring solution (version 607)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 8x + 24 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(1)(24)}}{2(1)}$$

$$x = \frac{-(8) \pm \sqrt{64 - 96}}{2(1)}$$

$$x = \frac{-8 \pm \sqrt{-32}}{2}$$

$$x = \frac{-8 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{-8 \pm 4\sqrt{2}\, i}{2}$$

$$x = -4 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $2 - 4i$ and $-3 - 5i$ in standard form $(a + bi)$.**

Solution

$$(2 - 4i) \cdot (-3 - 5i)$$

$$-6 - 10i + 12i + 20i^2$$

$$-6 - 10i + 12i - 20$$

$$-6 - 20 - 10i + 12i$$

$$-26 + 2i$$

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3. **Write function $f(x) = x^3 - 7x^2 - 6x + 72$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	-7	-6	72
4		4	-12	-72
	1	-3	-18	0

$$f(x) = (x - 4)(x^2 - 3x - 18)$$

$$f(x) = (x - 4)(x - 6)(x + 3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 2)^2 \cdot (x - 1) \cdot (x - 4)$$

Sketch a graph of polynomial $y = p(x)$.